Aviation Safety Inspector (ASI) Training for Technically Advanced Aircraft

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Recently, there has been an emergence of technically advanced "glass cockpit" aircraft, within general aviation. Aside from technical challenges presented by the design of these advanced avionics systems, there are difficulties in acquiring a conceptual understanding of the functions offered by the avionics, developing system monitoring skills and habits, developing mode management and awareness skills, understanding when and when not to use automation, and maintaining manual flying skills. Operating aircraft with advanced avionics requires an additional set of knowledge elements and skills. Currently, FAA aviation safety inspectors (ASIs) are required to inspect technically advanced aircraft, check certified flight instructors, and conduct surveillance of designated pilot examiners who are certifying pilots operating technically advanced aircraft. Therefore, the aim of this project is to provide general aviation safety inspectors with the skills needed regarding technically advanced aircraft.

INTRODUCTION

Technically advanced aircraft (TAA) are becoming more prevalent in the General Aviation fleet (AOPA, 2005). Recently, there has been an emergence of technically advanced "glass cockpit"aircraft within general aviation. TAA are generally equipped with IFR GPS navigation equipment with a moving map or a multi-function display (MFD) that displays weather, traffic, or terrain, and has an integrated autopilot (AOPA, 2005; FAA, 2003). Aside from the technical challenges presented by the design of these advanced avionics systems, there are difficulties in acquiring a conceptual understanding of the functions offered by the avionics. Paul Craig and colleagues are examining how best to teach new general aviation pilots in these sophisticated systems (Craig, Bertrand, Dornan, Gossett, & Thorsby, 2005). Casner (2005) generated a detailed list of the knowledge and skills required to be proficient in TAA. Included are the human factors considerations that are required such as the impact of advanced navigation displays on situation awareness and aeronautical decision making given available weather information. These are simply a few of the many factors that are present when considering TAA. Advanced automation introduces both pros and cons; however, regardless of where energy is focused, the recent influx of these aircraft will require additional learning for many in aviation including instructors, examiners, and inspectors.

FAA aviation safety inspectors (ASIs) are required to inspect TAA, check certified flight instructors, and conduct surveillance of designated pilot examiners who are certifying pilots operating TAA. However, many of the ASIs within the FAA workforce completed flight training prior to the entry of advanced avionics.

Therefore, general aviation ASIs need to be more knowledgeable of the capabilities, limitations, and the normal and emergency operating procedures in these aircraft so that they may safely and competently perform their inspection, checking, and surveillance functions for general aviation operators who have these types of aircraft.

ASW-260 has been tasked to develop a "Qualification Course for Technically Advanced Aircraft" and an "Evaluation Course for Technically Advanced Aircraft" for ASIs. The proposed Qualification course will provide an overview of three major TAA electronic flight systems used in general aviation. The evaluation course will instruct ASIs how to evaluate pilots and DPEs who operate a TAA. The aim of this

project is to insure that aviation safety inspectors are provided with the skills needed for their job regarding TAA.
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METHOD

Two courses, the Qualification Course for Technically Advanced Aircraft and the Evaluation Course for Technically Advanced Aircraft, have been developed to educate general aviation ASIs on the capabilities, limitations, and the normal and emergency-operating procedures in TAA.

Course Descriptions

The initial prerequisite course is to provide ASIs with an overview of three major TAA electronic flight systems used in general aviation. The evaluation course will instruct ASIs how to evaluate pilots and DPEs who operate a TAA. The course will provide ASIs with the minimal proficiency standards required to operate a TAA.

After completing each of these courses, ASIs will complete course evaluations on their impressions of the course content and the extent to which the courses prepared them to perform their TAA job functions. Additionally, respondents will complete a competency check in both courses.

Participants

Participants will be Aviation Safety Inspectors that enroll in FAA-sponsored courses (18803 and 18830) organized through Embry Riddle Aeronautical University. In the future, additional university campuses will assist in the delivery of these courses.

Participants will receive a prerequisite course evaluation and an evaluation course feedback survey. The surveys address ASIs perceptions of their proficiency as a result of the courses and course content.

Prerequisite Course Survey Content

Respondents will rate the degree to which the course material was related to their job duties, how well they can explain symbols used for navigation and terrain on the multifunction display and how prepared they are to perform system failures in TAA.

Evaluation Course Content

Respondents will rate how effective the course material was in preparing them for surveillance of TAA, how well the check-ride allowed them to demonstrate their proficiency, how well they understand the human factors implications within TAA, and the extent of their understanding of simulating TAA system failures. Additionally, participants will be asked if they have had any previous hands-on experience with TAA.

Participants will be assured that the surveys are voluntary and that they may choose not to answer any particular question. The right to refuse to participate will be inherent in the survey process, as participants will only complete the survey if they choose to do so.

RESULTS

The first collection of evaluation data is set to commence in October 2005 at ERAU in Daytona Beach. Data will be analyzed using simple descriptive statistics (e.g., frequencies, means, and proportions). Open-ended questions and comments will be content-coded and analyzed with descriptive statistics as well. Summary reports will be created by course provided the courses have at least 8 respondents. We plan to use the data to improve the courses and ensure that ASIs are learning the skills required to perform their duties regarding TAA.

REFRERENCES

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